

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

1. (currently amended) A medium reading apparatus, comprising:

a media drive ~~means~~ for driving a medium on which first data are recorded;

a drive circuit for electrically controlling and driving the media drive ~~means~~;

a read ~~means~~ device for reading ~~and supplying the first~~ data recorded on said medium as electric signals;

a signal processing circuit for processing ~~the output~~ signals of the read ~~means~~ device and reproducing data;

and a control device for controlling said drive circuit and the signal processing circuit,

~~wherein said control device has a semiconductor integrated circuit in which a nonvolatile memory capable of electrically writing data unit by unit and electrically erasing data collectively block by block, each block being larger than the unit, and a control section operating in accordance with a program area formed on a single semiconductor chip,~~

~~said control section manages units in a prescribed area~~

~~in said nonvolatile memory, writes data into the prescribed area unit by unit, erases data from a block included in the prescribed area when data are written into a plurality of units included in the prescribed area, and writes data in the units in the erased block.~~

wherein the control device includes a semiconductor integrated circuit in which a central processing unit, a random access memory and a nonvolatile memory are formed on a single semiconductor chip,

wherein the central processing unit controls the control device,

wherein the random access memory temporarily stores data and provides a work area to the central processing unit,

wherein the nonvolatile memory includes a first area in which user data are stored, a second area in which an application program is stored, and a third area in which a vector table, accessed when a predetermined interrupt occurs to the central processing unit, is stored,

wherein the nonvolatile memory is operable to electrically write data unit by unit and electrically erase data block by block,

wherein the first area includes a plurality of blocks, each of the blocks having a plurality of units,

wherein each of the units includes a fourth area in which bits to manage user data are stored and a fifth area in which

user data are stored,

wherein if user data are not written in the fifth area,
first bits are written in the fourth area, and if user data
are written in the fifth area, second bits are written in the
fourth area, and

wherein the first bits of the fourth area are rewritten
to the second bits when user data are written in the fifth
area.

2. (currently amended) The medium reading apparatus
according to claim 1, wherein said nonvolatile memory ~~has an~~
~~element formed in the same process as that of forming the~~
~~element constituting said control section~~ includes a region
formed by a process for forming the central processing unit.

3. (currently amended) The medium reading apparatus
according to claim 1, wherein ~~said control section writes data~~
~~generated by the execution of a program stored in said~~
~~nonvolatile memory unit by unit into said prescribed area of~~
~~the nonvolatile memory~~ when a value of a unit pointer
increments a first time, the bits of the fourth area of the
unit indicated by the value of the unit pointer are read and
if the bits of the fourth area of the unit indicated by the
value of the unit pointer are matched to the second bits, then
the value of the unit pointer increments a second time.

4. (currently amended) The medium apparatus according to claim [[1]] 3, wherein ~~the functions of unit management, data writing and data erasion by said control section over said nonvolatile memory are realized by a program stored in said nonvolatile memory~~ when a number of the units corresponding to a size of a block is counted by an increment operation of the unit pointer, data stored in the counted units are erased.

5. (currently amended) The medium reading apparatus according to claim 1, wherein the user data written into said nonvolatile memory ~~concerns the~~ includes data regarding a type of said medium.

6. (currently amended) The medium reading apparatus according to claim 1,

~~wherein data indicating whether or not the data in each unit are significant are written in to each of the units constituting said prescribed area of said nonvolatile memory~~ each fourth area includes a sixth area in which second data for use in checking the user data stored in a corresponding fifth area is stored, and

wherein each fourth area includes a seventh area in which arbitrary one of the first bits and the second bits can be stored.

7. (currently amended) The medium reading apparatus according to claim [[1]] 6,

~~wherein data for use in checking the reliability of data in each unit are written into each of the units constituting said prescribed area of said nonvolatile memory~~ the second data are used as a check data SUM,

wherein before user data are written in a predetermined area of the units, the second data are generated by the control device, and then user data and the second data are written in the predetermined area, and

wherein after user data are written in the predetermined area, user data are read from the predetermined area, processed and compared with the second data in the predetermined area to determine whether there is an error in connection with the user data written in the predetermined area.

8. (currently amended) The medium reading apparatus according to claim 7, ~~wherein, when reading data from said medium, check data for the read data are referred to and if the read data are judged to be abnormal, the data written before the writing of the currently read data area read out~~

wherein if the error is detected, the user data written in the unit preceding the predetermined area are read.

9. (currently amended) The medium reading apparatus

according to claim 1, wherein ~~data to be written into said prescribed area of said nonvolatile memory are information the~~
user data includes third data concerning manufacturing
fluctuations in said media drive ~~means and~~ said read means
device.

10. (currently amended) The medium reading apparatus
according to claim 1, wherein ~~data to be written into said prescribed area of said nonvolatile memory are information the~~
user data includes fourth data concerning characteristics of
the medium obtained by accessing said medium.

11. (canceled).

12. (currently amended) The medium reading apparatus
according to claim 1, wherein ~~the a data erasion erasure of~~
the nonvolatile memory includes writing of prescribed data.

13. (new) The medium reading apparatus according to
claim 1, wherein when a value of a unit pointer decrements,
the bits of the fourth area of the unit indicated by the value
of the unit pointer are read, then if the bits of the fourth
area of the unit indicated by the value of the unit pointer
are matched to the first bits, the user data are stored in the
unit indicated by the value of the unit pointer, then if the
bits of the fourth area of the unit indicated by the value of
the unit pointer are matched to the second bits, the value of

the unit pointer decrements again.

14. (new) The medium reading apparatus according to claim 13, wherein when a number of the units corresponding to a size of a block is counted by a decrement operation of the unit pointer, data stored in the first area are erased.

15. (new) The medium reading apparatus according to claim 1, wherein the control device manages a unit pointer to determine which unit user data is written to and which unit user data is read from.

16. (new) A semiconductor integrated circuit, comprising:

a nonvolatile memory for electrically writing data unit by unit and electrically erasing data block by block;

a central processing unit;

and a random access memory for temporarily storing data and providing a work area to the central processing unit,

wherein the nonvolatile memory, the central processing unit and the random access memory are formed on a single semiconductor chip,

wherein the nonvolatile memory includes a first area in which first data are stored, a second area in which a predetermined program is stored, and a third area in which a vector table, accessed when a predetermined interrupt occurs

to the central processing unit, is stored,

wherein the first area of the nonvolatile memory includes a plurality of the blocks and each of the blocks includes a plurality of units,

wherein each of the units includes a fourth area in which bits to manage first data are stored and a fifth area in which first data are stored,

wherein if first data are not written into the fifth area, first bits are written into the fourth area, and if first data are written into the fifth area, second bits are written into the fourth area, and

wherein the first bits of the fourth area are rewritten to the second bits when first data are written in the fifth area.

17. (new) The semiconductor integrated circuit according to claim 16, wherein said nonvolatile memory includes a region formed by a process for forming the central processing unit.

18. (new) The semiconductor integrated circuit according to claim 16, wherein when a value of a unit pointer increments a first time, the bits of the fourth area of the unit indicated by the value of the unit pointer are read, then if the bits of the fourth area in the unit indicated by the value of the unit pointer are matched to the first bits, the

first data are stored in the unit indicated by the value of the unit pointer, and if the bits of the fourth area of the unit indicated by the value of the unit pointer are matched to the second bits, the value of the unit pointer increments a second time.

19. (new) The semiconductor integrated circuit according to claim 16, wherein when a number of the units corresponding to a size of a block are counted by an increment operation of the unit pointer, data stored in the counted units are erased.

20. (new) The semiconductor integrated circuit according to claim 16,

wherein each fourth area includes a sixth area in which second data for checking the first data stored in a corresponding fifth area are stored, and

wherein each fourth area includes a seventh area in which arbitrary one of the first bits and the second bits can be stored.

21. (new) The semiconductor integrated circuit according to claim 20,

wherein the second data are used as a check data SUM,

wherein before first data are written in a predetermined area of the units, the second data are generated and then

user data and the second data are written in the predetermined area, and

wherein after first data are written in the predetermined area, first data are read from the predetermined area, processed and compared with the second data in the predetermined area to determine whether there is an error in connection with the first data written in the predetermined area.

22. (new) The semiconductor integrated circuit according to claim 16, wherein a data erasure of the nonvolatile memory includes writing of prescribed data.

23. (new) The semiconductor integrated circuit according to claim 16, wherein when a value of a unit pointer decrements, the bits of the fourth area of the unit indicated by the value of the unit pointer are read, then if the bits of the fourth area of the unit indicated by the value of the unit pointer are matched to the first bits, the first data are stored in the unit indicated by the value of the unit pointer, then if the bits of the fourth area of the unit indicated by the value of the unit pointer are matched to the second bits, the value of the unit pointer decrements again.

24. (new) The semiconductor integrated circuit according to claim 23, wherein when a number of units

corresponding to a size of a block is counted by a decrement operation of the unit pointer, data stored in the counted units are erased.

25. (new) The semiconductor integrated circuit according to claim 16, wherein the semiconductor integrated circuit manages a unit pointer to determine which unit first data is written to and which unit first data is read from.

26. (new) A semiconductor integrated circuit formed on a single semiconductor chip, comprising:

a central processing unit;

a random access memory, coupled to the central processing unit, to temporarily store data and provide a work area to the central processing unit; and

a nonvolatile memory, coupled to the central processing unit, including a first area in which data are stored, a second area in which a predetermined program is stored, and a third area in which a vector table is stored, the first area including a plurality of blocks each having a plurality of units, each of the units including a fourth area in which bits to manage user data are stored and a fifth area in which the user data are stored, the nonvolatile memory being operable to write data unit by unit and read data block by block;

wherein first bits are written into the fourth area of a unit when the unit is erased, and second bits are written into

the fourth area of the unit when the user data are written
into the fifth area of the unit.